



PRESS RELEASE

Coupled inductors for step-down DC-DC voltage regulators

Focus EDL has introduced what is claimed to be the industry's first family of coupled inductors for non-isolated step-down DC-DC voltage regulators. According to Focus EDL, these bring a faster transient response, lower ripple current per phase and increased system efficiency.

The PA131xNL is a family of off-the-shelf, surface-mount, RoHS-compliant inductors, with 2, 3, 4, or 5 phases magnetically coupled together in a single part. Each phase has an equivalent transient inductance of 50nH and a magnetizing inductance greater than 250nH. Each phase is rated for 40A and has a direct current resistance of 0.5 milliohms maximum. These parts can accommodate a 5A current imbalance between phases, ensuring they will operate well in less-than-ideal conditions.

Produced by Pulse, these multi-phase coupled inductors have been developed and manufactured under a license agreement with Volterra to support that company's VT1165M and VT1115M chipsets which implement its patented coupled inductor topology. This innovative inductor solution provides a highly efficient voltage regulation system with low system cost.

In a non-coupled multi-phase DC/DC converter, each phase has an independent inductor. To improve transient response, the value of this inductor must be reduced. However, this reduction causes an increase in current ripple per phase and a decrease in efficiency. With a coupled inductor topology, all of the inductors are integrated on the same magnetic core and the interaction of the magnetic fields from each phase enables the use of a lower equivalent inductance for faster transient response without increasing the current ripple per phase. The reduction in ripple current in a coupled inductor topology compared to a non-coupled solution is approximately 50% for a 2-phase system, 66% for 3-phase, 73% for 4-phase, and 77% for a 5-phase system.